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Published in:
Book of Abstracts. DTU's Sustain Conference 2015

Publication date:
2015

Document Version
Publisher's PDF, also known as Version of record

Screening of novel microbial catalyst in Bioelectrochemical systems (BES)

Nabin Aryal[1], Pier-Luc Tremblay[1], Tian Zhang[1]*
1: Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark, Kogle Allè 6 DK-2970 Hørsholm
*Corresponding author: zhang@biosustain.dtu.dk

Microbial Electrosynthesis (MES) is an artificial type of photosynthesis for microbial conversion of carbon dioxide ($CO_{2)}$ to organic chemical commodities when it utilizes the electricity from the solar cell. Some of acetogens, obligate anaerobic bacteria able to accept electrons from the cathode and produce chemicals. Until now, limited numbers of microorganisms have been defined for the cathodic reduction of CO_2 in MES system. The electron transfer rate from the cathode to the best electro autotroph *S. ovata 2662*, are still significantly lower than what is observed in bio-anodic processes with other electrotrophic bacteria. Hence, we are screening other pure cultures for better MES activities. With the objective of finding new cathodic biocatalysts, pre-selections of acetogens were done based on their performance in syngas fermentation technology. In our study, novel electrotrophic bacteria have been identified with the production rate of 368.8 mM per day per m^2 for 14 days, which is almost three-fold higher than the best reported result in the literature obtained with a pure culture of a different strain of *Sporomusa ovata.*

Keywords: - Microbial electrosythesis, CO_2 reduction, *Sporomusa ovata*

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